STEVAL385LED4CH

200 W, digital 4-LED channels demonstration board with STLUX385A-controlled current regulation and dimming

Data brief

Features

- Based on the STLUX385A digital controller
- Up to 200 W
- 4 LED channels
- Adjustable LED current and dimming
- Adaptive voltage compensation
- Real-time fault detection and protection (e.g: short or open circuit)
- Serial interface
- DALI (optional)

Description

The STEVAL385LED4CH demonstration board is a complete and configurable solution to manage four independent high-brightness LED channels using the STLUX385A digital controller. The STLUX385A is a part of the STMicroelectronics® STLUX™ product family and embeds advanced peripherals tailored to generate high resolution PWM signals (SMED).

The STEVAL385LED4CH device implements inversed buck topology to drive each LED channel. The SMED technology integrated in the STLUX385A device regulates the LED current, exploiting the fixed-off-time (FOT) principle. Each channel can output current in the range of 250 mA to 1 A.

The number of LEDs, the current and the PWM dimming working point can be set through the command interpreter, accessible via the serial interface. Dimming can also be manually adjusted via the three on-board buttons.

The demonstration board can be optionally controlled via a DALI interface. The DALI connection board is available separately (part number STEVAL-ILM001V1). The STLUX385A DALI software drivers and application firmware are available.

This demonstration board is available also with an order code STEVAL-ILL057V1.

1 Board description

Figure 1. Jumper and connector location

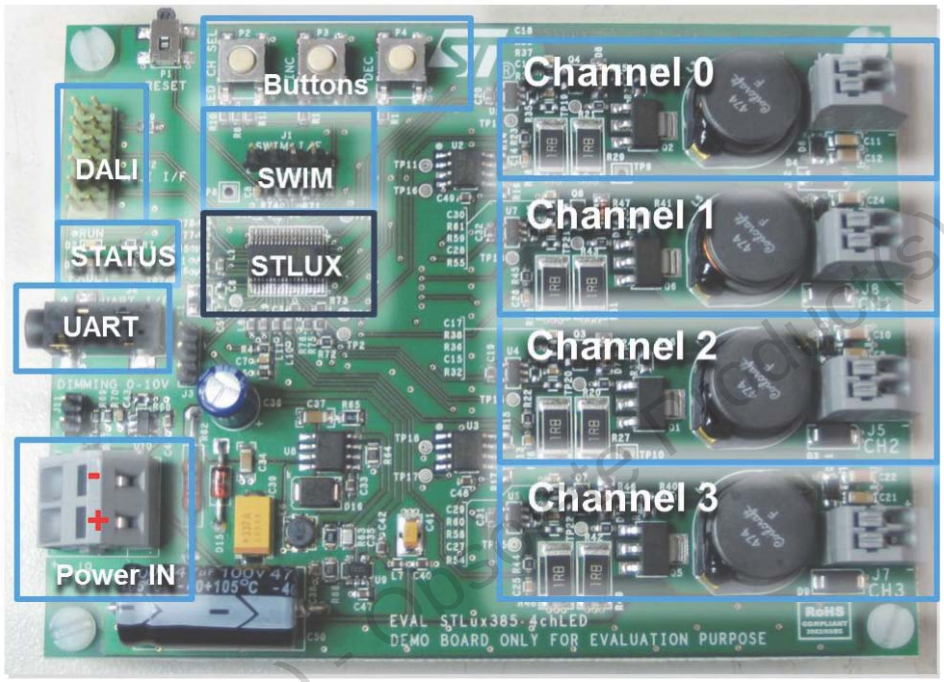


Table 1. Connector pinout

Name	Function
Power IN (J9)	Input power connection. Range: 12 - 48 V.
DALI	DALI connector. Compatible with STEVAL-ILM001V1 demonstration board.
UART	Serial link. Connector: jack mono 3.5 mm The UART cable is provided with the demonstration board.
SWIM	SWIM interface.
CH0 (J6)	LED string connector, channel 0.
CH1 (J8)	LED string connector, channel 1.
CH2 (J5)	LED string connector, channel 2.
CH3 (J7)	LED string connector, channel 3.

Figure 2. STEVAL385LED4CH - schematic 1 of 3

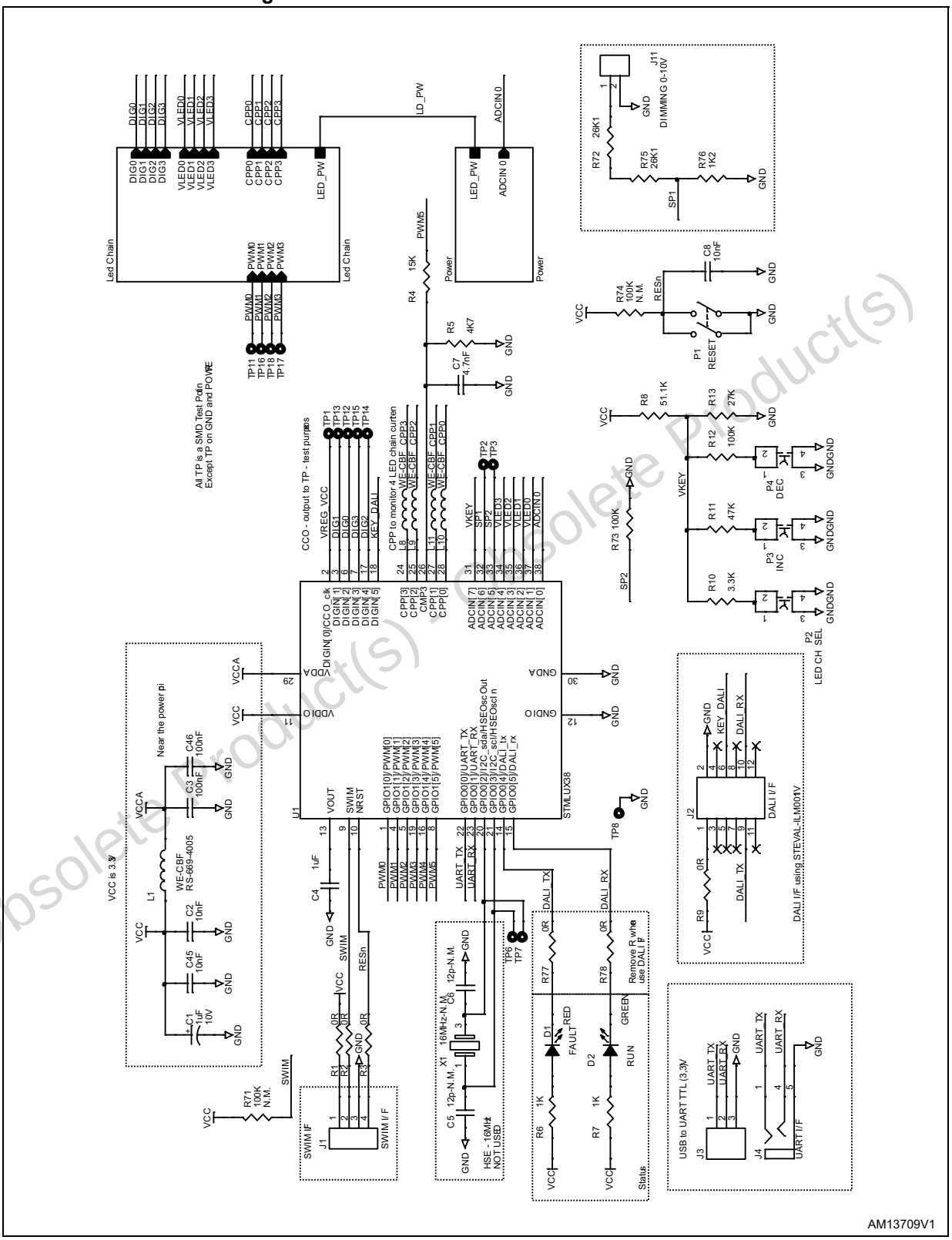


Figure 3. STEVAL385LED4CH - schematic 2 of 3

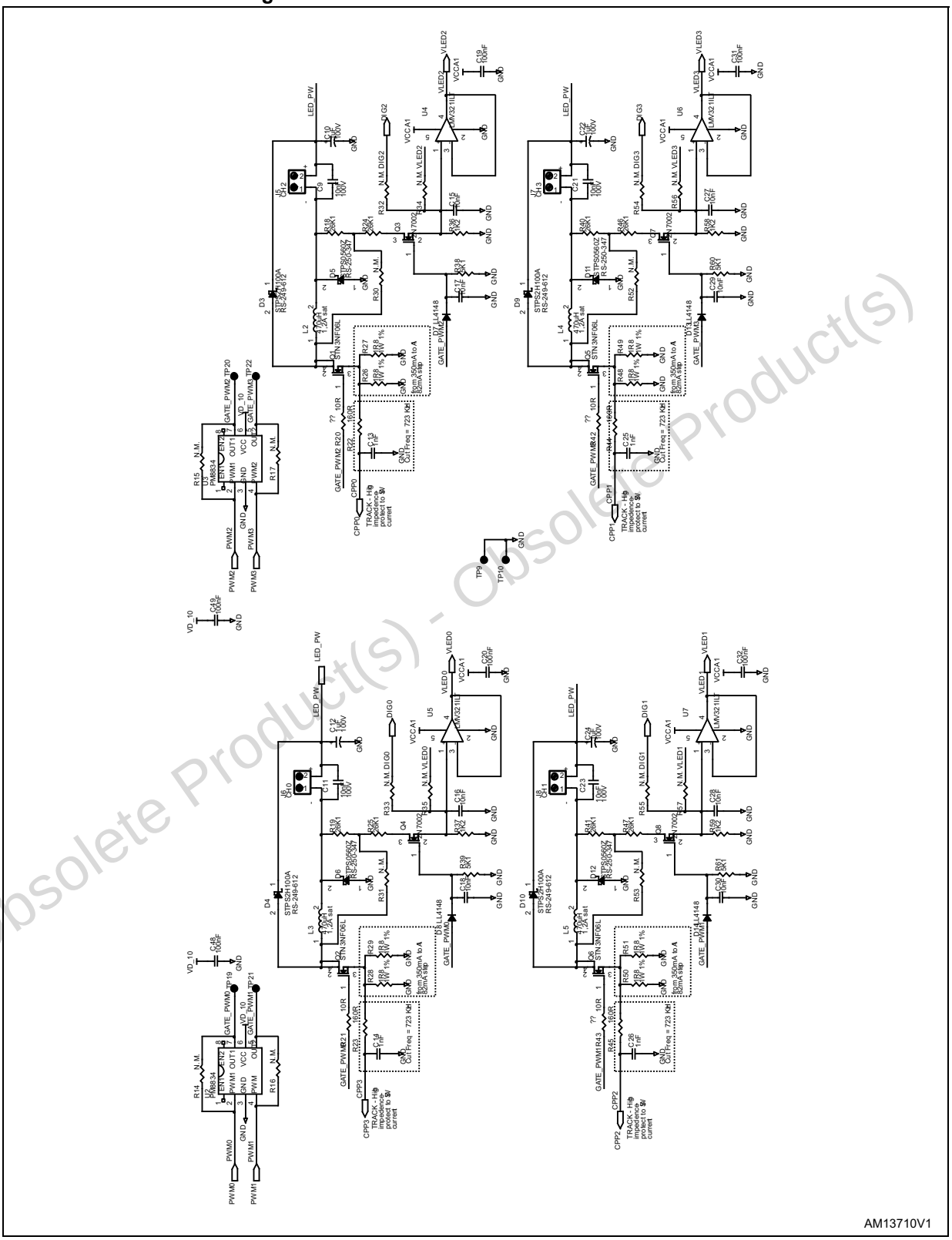
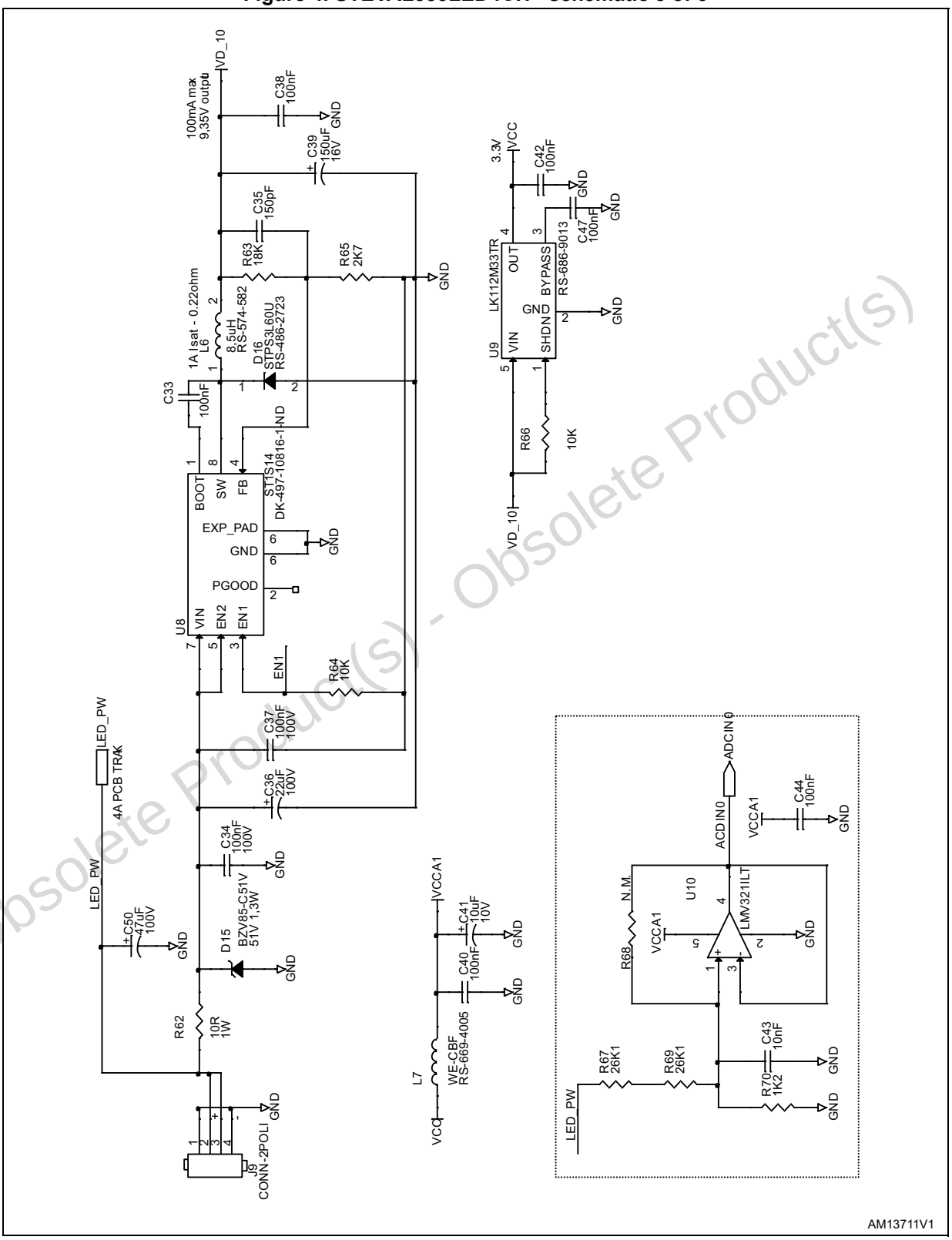


Figure 4. STEVAL385LED4CH - schematic 3 of 3



2 Bill of material

Table 2. STEVAL385LED4CH - bill of material

Item	Qty.	Reference	Part value	Decal	Note
1	2	C1, C4	1 µF	CAPC-0603	10 V
2	4	C2, C8, C43, C45	10 nF	CAPC-0603	
3	8	C3, C19, C20, C31, C32, C40, C44, C46	100 nF	CAPC-0603	
4	2	C5, C6	12 pF - N. M.	CAPC-0603	Not mounted
5	1	C7	4.7 nF	CAPC-0603	
6	4	C9, C11, C21, C23	10 nF	CAPC-1206	100 V
7	4	C10, C12, C22, C24	1 µF	CAPC-1206	100 V
8	4	C13, C14, C25, C26	1 nF	CAPC-0603	
9	8	C15, C16, C17, C18, C27, C28, C29, C30	10 nF	CAPC-0603	
10	6	C33, C38, C42, C47, C48, C49	100 nF	CAPC-0603	25 V
11	2	C34, C37	100 nF	CAPC-1206	100 V
12	1	C35	150 pF	CAPC-0805	25 V
13	1	C36	22 µF	D250P100	100 V
14	1	C39	150 µF	CAPC-7343	16 V
15	1	C41	10 µF	V-3216	10 V
16	1	C50	47 µF	CAP-AXP1000D400	100 V
17	1	D1	FAULT	LEDC-0603	
18	1	D2	RUN	LEDC-0603	
19	4	D3, D4, D9, D10	STPS2H100A	SMA	
20	4	D5, D6, D11, D12	STPS0560Z	SOD123	
21	4	D7, D8, D13, D14	LL4148	SOD80-st	
22	1	D15	BZV85-C51V	DO41	51 V, 1.3 W
23	1	D16	STPS3L60U	SMB	
24	1	J1	SWIM I/F	4PIN-P254	
25	1	J2	DALI I/F	PIN2X6P254	
26	1	J3	UART I/F - TTL	3PIN-P254	
27	1	J4	UART I/F	JACK-3_5-35RASMT2BHNTRX	
28	1	J5	CH2	MOR-2POLI-WAGO-250-402	
29	1	J6	CH0	MOR-2POLI-WAGO-250-402	
30	1	J7	CH3	MOR-2POLI-WAGO-250-402	

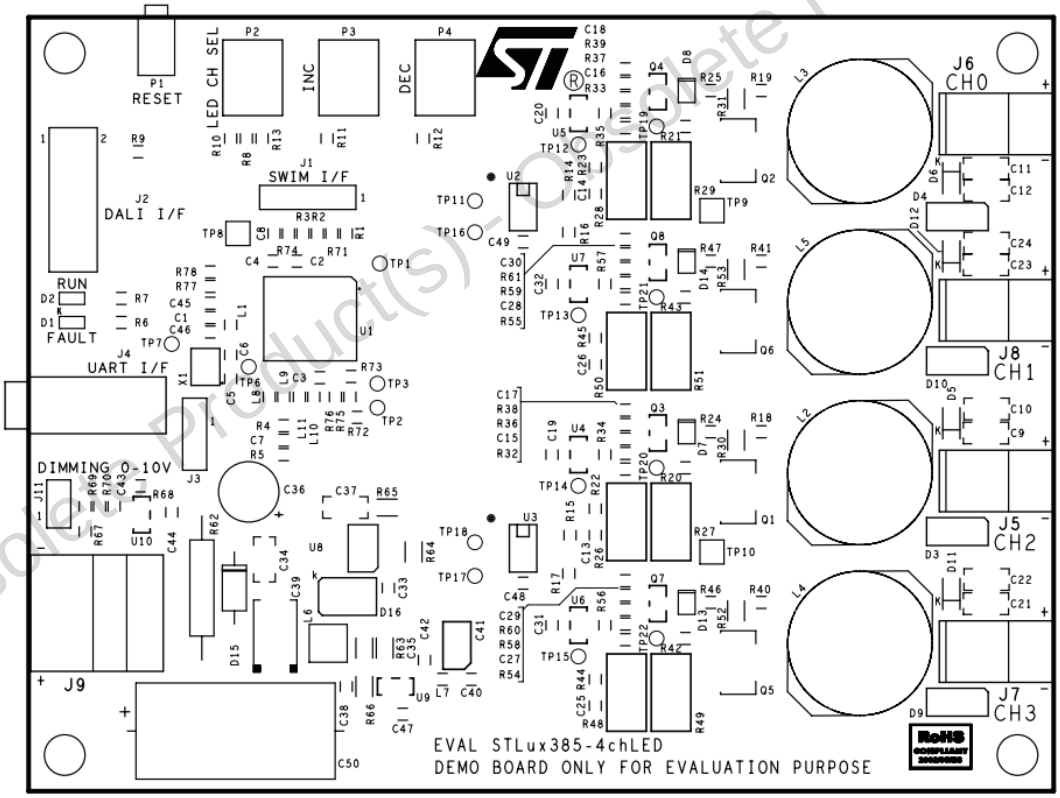
Table 2. STEVAL385LED4CH - bill of material (continued)

Item	Qty.	Reference	Part value	Decal	Note
31	1	J8	CH1	MOR-2POLI-WAGO-250-402	
32	1	J9	CONN-2POLI	MOR-2POLI-WAGO-236-402	
33	1	J11	DIMMING 0-10 V	2PIN-P254	
34	2	L1, L7	WE-CBF	CAPC-0603	
35	4	L2, L3, L4, L5	470 µH	DS5022P-Coilcraft	1.2 A sat
36	1	L6	8.5 µH	ELL4GG-Panasonic	
37	4	L8, L9, L10, L11	WE-CBF	CAPC-0603	
38	1	P1	RESET	EVQPSM-Panasonic	
39	1	P2	LED CH SEL	SMD-SWITCH-B3FS	
40	1	P3	INC	SMD-SWITCH-B3FS	
41	1	P4	DEC	SMD-SWITCH-B3FS	
42	4	Q1, Q2, Q5, Q6	STN3NF06L	SOT223	
43	4	Q3, Q4, Q7, Q8	2N7002	SOT23	
44	10	R1, R2, R3, R9, R77, R34, R35,R56, R57, R68, R78	0 Ω	RESC-0603	
45	1	R4	15 KΩ	RESC-0603	
46	1	R5	4.7 KΩ	RESC-0603	
47	2	R6, R7	1 KΩ	RESC-0603	
48	1	R8	51.1 KΩ	RESC-0603	
49	1	R10	3.3 KΩ	RESC-0603	
50	1	R11	47 KΩ	RESC-0603	
51	2	R12, R73	100 KΩ	RESC-0603	
52	1	R13	27 KΩ	RESC-0603	
53	8	R14, R15, R16, R17, R32, R33, R54, R55	Not mounted	RESC-0603	Not mounted
54	12	R18, R19, R24, R25, R40, R41,	26.1 KΩ	RESC-0603	
		R46, R47, R67, R69, R72, R75			
55	4	R20, R21, R42, R43	10 Ω	RESC-0603	
56	4	R22, R23, R44, R45	160 Ω	RESC-0603	
57	8	R26, R27, R28, R29, R48, R49, R50,R51	1.8 Ω	R2512	1 W 1%
58	4	R30, R31, R52, R53	Not mounted	RESC-0805	Not mounted
59	6	R36, R37, R58, R59, R70, R76	1.2 KΩ	RESC-0603	
60	4	R38, R39, R60, R61	5.1 KΩ	RESC-0603	
61	1	R62	10 Ω	R700DIAM100	1 W
62	1	R63	18 KΩ	RESC-0805	

Table 2. STEVAL385LED4CH - bill of material (continued)

Item	Qty.	Reference	Part value	Decal	Note
63	2	R64, R66	10 KΩ	RESC-0805	
64	1	R65	2.7 KΩ	RESC-0805	
65	2	R71, R74	100 KΩ	RESC-0603	Not mounted
66	1	U1	STMLUX38	TSSOP38	
67	2	U2, U3	PM8834	SOI8	
68	5	U4, U5, U6, U7, U10	LMV321ILT	SOT23-5L	Not mounted
69	1	U8	ST1S14	SO8-EP-9	
70	1	U9	LK112M33TR	SOT23-5L	
71	1	X1	16 MHz - N.M.	X32-3_2x2_5-MEC	Not mounted

Figure 5. STEVAL385LED4CH - layout (top layer)



3 Revision history

Table 3. Document revision history

Date	Revision	Changes
04-Apr-2013	1	Initial release.
29-May-2014	2	Updated *Section : Description on page 1* (replaced “MASTERLUX™” by “STLUX™”, added “This demonstration board is available also with an order code STEVAL-ILL057V1.” sentence). Updated *Table 2: STEVAL385LED4CH - bill of material on page 6* (updated units, values, minor modifications). Minor modifications throughout document.